DOCUMENT RESUME

ED 479 687 IR 022 046

AUTHOR	Maring, Gerald H.; Schmid, Jason A.; Roark, Jeremy
TITLE	An Educator's Guide to High-End Videoconferencing.
INSTITUTION	Washington State Univ., Pullman. Coll. of Education.
SPONS AGENCY	Department of Education, Washington, DC.
PUB DATE	2003-00-00
NOTE	17p.; Prepared by the Department of Teaching and Learning.
AVAILABLE FROM	For full text: http://education.wsu.edu/literacy/Media/highend.pdf.
PUB TYPE	Guides - Non-Classroom (055)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Assisted Instruction; Computer Mediated Communication; Educational Equipment; Educational Technology; Elementary Secondary Education; *Interactive Video; Internet; Learning Activities; Student Projects
IDENTIFIERS	Video Technology; *Video Telecommunications; *Video Teleconferencing

ABSTRACT

This document describes the origins of cybermentoring and focuses on projects with elementary and secondary schools throughout the state of Washington. It discusses use of telephone communication, email, web design, and low-end videoconferencing technologies in initial cyberprojects, and recent cyberprojects that have begun to make use of high-end videoconferencing systems and associated cutting-edge technologies in order to increase student and teacher satisfaction as well as to augment the quality of interaction and authenticity of the mentor-student relationships that are forged. Research and development projects conducted during the 2000-2001 and 2001-2002 academic years by researchers and preservice teachers at Washington State University used high-end videoconferencing systems and brought together University faculty and students with K-12 students and teachers at remote sites. The following projects are briefly highlighted: Grade 4 science mentoring; Grade 9 reading immersion; and Grade 9 earth science curriculum planning. Projects in 2003 included: Grade 9 reading immersion; Grades 6, 7 and 8 reading comprehension and fluency; high school math mentoring; and Grade 9 English as a Second Language (ESL) tutoring. Brief descriptions are provided of systems and products manufactured by the following companies: Polycom Inc., Tandberg Corporation, Sony, VTEL. Optional components are then discussed, followed by technical and general considerations. (AEF)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 479 687

An Educator's Guide to High-End Videoconferencing

BEST COPY AVAILABLE

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Maring, G.H.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

IR022046

The Origins of Cybermentoring

Cybermentoring is the interaction of mentors and students via computer, tele and video communications. The goal of projects and interactions carried out in this manner is to positively impact student learning and pique student as well as teacher interest in a topic by making use of new and exciting technologies.

To date, many projects with elementary and secondary schools throughout the state of Washington have taken place. All demonstrate a positive impact on student learning and satisfaction as well as illustrate the usefulness and great potential of cutting-edge technology in education.

The Future of Cybermentoring

In the initial cyberprojects, telephone communication, email, web design, and low-end videoconferencing technologies were the primary technologies being used. Recent cyberprojects, however, have begun to make use of high-end videoconferencing systems and associated cutting-edge technologies in order to increase student and teacher satisfaction as well as to augment the quality of interaction and authenticity of the mentor-student relationships that are forged.

BEST COPY AVAILABLE

For educational applications, high-end videoconferencing allows for interaction between school sites, even at great distances, with television-like clarity and premium sound quality. These abilities allow for the creation of partnerships between remote sites while still maintaining many of the facets of face to face communication crucial for quality educational experiences.

In mentoring situations, for example, high-end videoconferencing enables interaction between mentors and students in remote locations. This type of relationship can be fruitful in that it provides opportunities for preservice teachers to mentor K-12 students in content, literacy, and communication skills under the direction of teachers and professors. In this context, preservice teachers gain valuable practicum experiences while serving the needs of K-12 students.

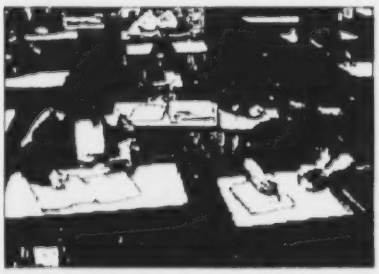
Videoconferencing allows mentors at distant sites to interact with students in many ways, including small group brainstorming, demonstration of reading skills, outlining, and image and prop presentation.

In addition to mentoring relationships, videoconferencing technology may be used to create cyberpartnerships among classroom teachers as well as between teachers, and students and faculty at higher education institutions. This networking creates an invaluable means for sharing information and ideas as well as great potential for constructing higher quality learning environments benefitting students, teachers, preservice teachers, and professors.

BEST COPY AVAILABLE

During the 2000-2001 and 2001-2002 academic years, researchers and preservice teachers at Washington State University conducted Research and Development projects using high-end videoconferencing systems. The projects brought together University faculty and students with K-12 students and teachers at remote sites.

Grade 4 Science mentoring- Researchers at Washington State University worked together with a fourth grade science class to learn about Weather topics using various types of media including books, magazines, the internet and television. The project culminated with written and verbal reports as well as a multipoint videoconference with a local television Meteorologist.



Grade 9 Reading Immersion- Researchers at Washington State University worked with a ninth grade class comprised of challenged readers to improve reading skills and comprehension. Using various techniques including Directed reading, Outlining, SQ3R, and Dictionary use, students improved their reading abilities while learning to enjoy reading more.

Grade 9 Earth Science Curriculum Planning- Students from Washington State University along with teachers from a rural school district in northeastern Washington worked together to design curricular materials for a pilot grade nine earth science class which was being developed in response to the State of Washington's Essential Academic Learning Requirements (EALRs).

BEST COPY AVAILABLE

Grade 9 Reading Immersion- Due to its success, this project continues in the same classroom. Preservice teachers from Washington State University facilitate reading between 9th grade and kindergarten students. Reading *Dr. Seuss* and other patterned books allow the older students to develop their reading skills while assisting the younger students as they begin their own journey in literacy development.

Grade 6, 7, & 8 Reading Comprehension and Fluency- Students in this program get after school practice in reviewing or preparing for their reading assignments in their "Great Books" and literature anthologies. Preservice teachers listen, model fluent reading, and assist with vocabulary and reading comprehension skills and strategies as needed.

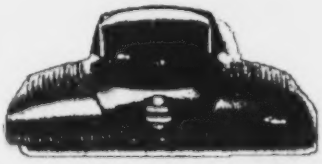
High School Math Mentoring- This project is supplemental to classroom instruction and assignments. The preservice teacher presents practical and application-level examples of how various mathematics concepts can be used outside the classroom. Through participation in the project, students who have performed inadequately or have been bored with math have become interested in learning math concepts and skills.

Grade 9 ESL Tutoring- This semester-long program was designed for a student who had recently immigrated and who requires intensive language training. Together with a Fulbright Exchange Scholar, a WSU student reinforces her learning with custom-tailored activities. Her school, like most schools in rural areas, simply does not have the resources to offer on site, intensive language tutoring. The use of high end video conferencing and the resources of a large university have not only made this pilot project possible, but have also produced a delineated model that can be adapted in many other schools.

BEST COPY AVAILABLE

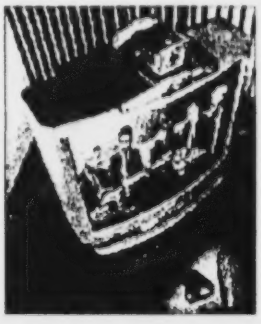
Polycom Inc. is a developer and manufacturer of communication devices. The company is well known for its teleconferencing systems which are fixtures in many businesses and educational institutions. However, Polycom is also known for its high quality, video communication systems.

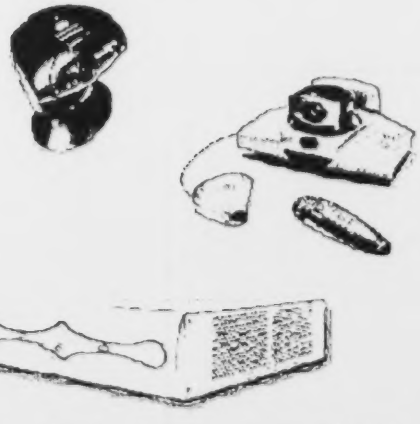
Polycom Soundstation IP teleconferencing phone



Polycom Viewstation 128 videoconferencing unit

Polycom manufactures various systems, from USB interface desktop cameras to high-end systems with IP and ISDN connectivity, which are designed for a wide array of video communication needs. High-end Polycom systems support multiple television monitors, document camera and Windows-based computer system connectivity, as well as transmission speeds up to 2 Megabits per second (mbs).





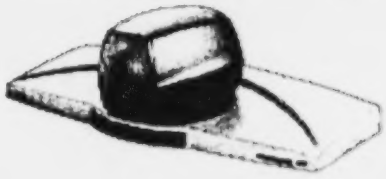
kwise from upper left: Polycom ViaVideo, Viewstation FX, and Viewstation 4000

There are Viewstation models designed for point-to-point videoconferencing as well as for multipoint applications. For more information about the products that Polycom Inc. offers see www.polycom.com.

BEST COPY AVAILABLE

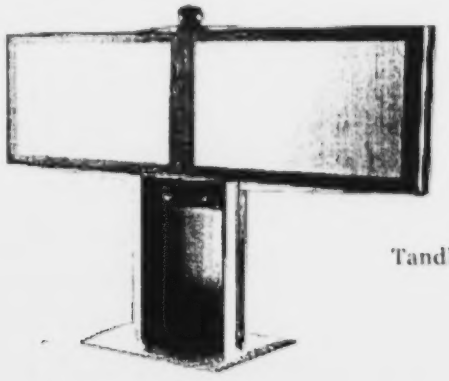
TANDBERG

Tandberg Corporation designs, manufactures, and supports videoconferencing systems as well as communication management software. The company offers a wide range of products designed for varying videoconferencing climates.

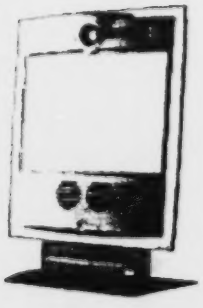


Tandberg 880

The company offers systems designed for single users, small to medium sized conference room systems which can support multiple cameras and microphones, and large, portable systems capable of supporting state of the art audio and video components. The company also offers multipoint capability in a rack mounted unit.



Tandberg 8000



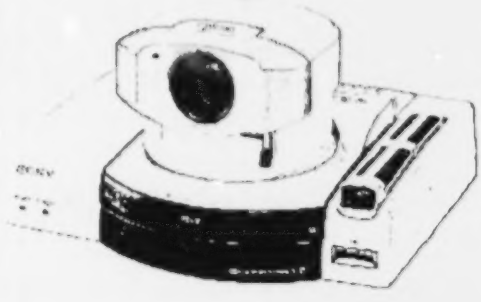
Tandberg 1000

All Tandberg units support both IP and ISDN protocols, PC based computer systems or PC Card Bus peripheral cards, and can connect at industry standard speeds as well as bandwidths of 2 to 3 Mbps. For more information visit http://www.tandberg.net.

BEST COPY AVAILABLE

Sony is a leader in the electronics industry. Their recent move into the videoconferencing market is not as well-known however. The company offers a variety of units primarily focused on the needs of high-end users.

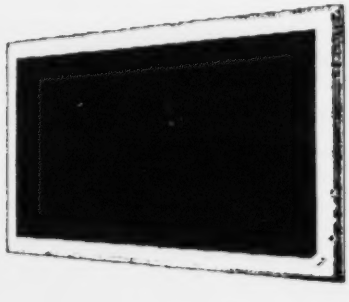
SONY



Sony PCS 1600

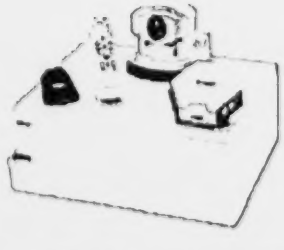
Many of the offerings are hardware bundles that provide for the highest-of-quality audio and video communication integration. Units use both ISDN and IP protocol and can connect at industry standard speeds as well as speeds of 2 Mbps. Units are also compatible with PC systems and a variety of other useful peripheral hardware.

High definition video equipment greatly enhances face-to-face interactions.



Sony PFM50C1

Sony also offers a unique feature in the integrated Memory Stick ™ port. The port allows users to save images and/or other items to removable Memory Stick ™ media and for easy incorporation into conferences. For more information, visit http://www.bssc.sel.sony.com.



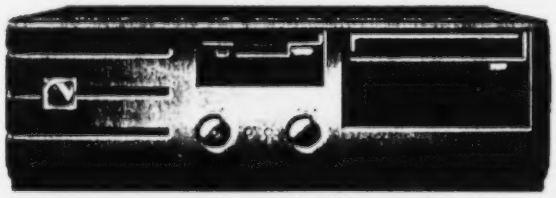
Sony PCS 6000ip

BEST COPY AVAILABLE

VTEL offers communication solutions for the videoconferencing needs of both educational institutions and private industry. The company offers primarily systems designed for users who require high quality audio and video with integrated PC features and capability.

VTEL Vista MX

Among the products VTEL offers are a recently introduced line of units that are hybrids of videoconferencing codecs and high output personal computers. The models boast all of the components of a computer incorporated into the same package as a videoconferencing unit capable of transmission rates up to 768 kbps. All units make use of either ISDN or IP connection protocols.



VTEL Vista Pro

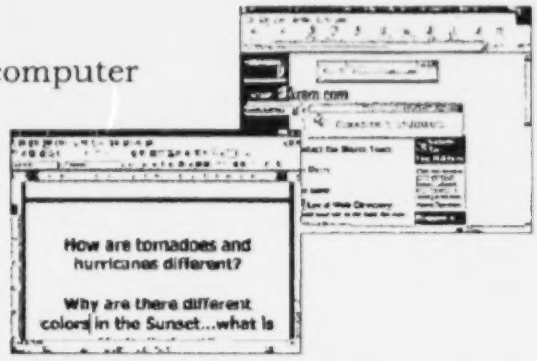
VTEL also offers TV mountable portable systems which are designed for use in high need multi-user environments. For more information visit http://www.vtel.com.

VTEL Vista VX Rack Mountable System

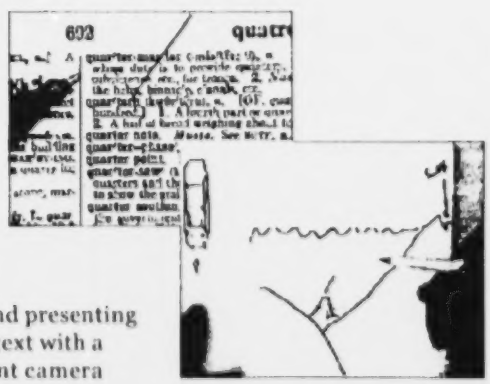
BEST COPY AVAILABLE

There are numerous optional components available for use with high-end videoconferencing systems. Each optional component enhances the usefulness of a the system while offering greater flexibility and customizability.

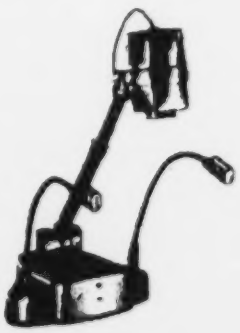
Windows based computer system- A computer connected to a Polycom unit allows users to share PowerPoint slide presentations as well as data in applications such as Microsoft Word and Internet Explorer. This leads to more effective collaborative teaching and learning.



Document camera- This option can be thought of as a digital overhead projector. It can be used to project written or printed documents as well as photographs at high resolution, allowing participants at all sites to be fully involved with presentation material.



Drawing and presenting printed text with a document camera



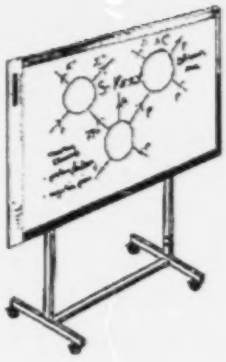
Videolabs DocCam Pro VC

VCR- A VCR connected to a Polycom system allows for recording of a conference at either the local, remote, or both sites (auto-recording). Recorded conferences are important for documentation, training, and dissemination purposes.

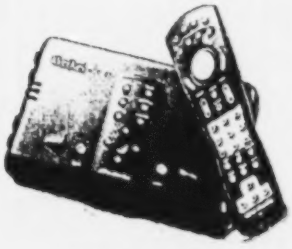
BEST COPY AVAILABLE

Mimio- A whiteboard is a valuable tool in any presentation. Mimio is a tool which allows for the digital capture of anything written or drawn on a whiteboard to a computer via a USB interface. Saved files can be transmitted electronically after or even during a videoconference to remote sites.

Mimio xi2



Scan converter- In order for some of the options listed here to be compatible with some videoconferencing systems, a special piece of hardware is required. The unit converts the video signal from a peripheral device such as a computer monitor (VGA) into the proper format to be displayed on a monitor used for a videoconferencing system display (NTSC, the format used for televisions and video monitors in the United States).



Averkey 500 pro
Scan Converter

Digital still and video cameras- Although these options are not necessarily connected directly to a videoconferencing system, they are vital for documentation and dissemination purposes. Products created using these valuable tools range from still photographs for publications, posters and training materials, and video footage from actual projects or interviews with participants for use in the creation of digital movies.

Optional peripheral devices greatly enhance the videoconferencing experience for all.

BEST COPY AVAILABLE

Most current high-end systems are compatible with other video communications systems as well as with Windows Netmeeting desktop videoconferencing software. No matter what systems are used, however, the video and sound quality is always limited to the connection speed of the lowest quality unit. Thus, a higher quality unit can "force" a lower speed unit to receive video and audio at its specified speed.

In most situations, a connection speed of 384 kilobits (kbs) per second is sufficient to provide high quality video and audio transmission. At lower speeds (e.g., 128 or 256 kbs), transmission quality tends to be low, and quality of learning and satisfaction with the technology is lessened. This fact is vital because many schools and districts are not currently equipped for high bandwidth video communications.

Another consideration is connection protocol. A unit connected via ISDN (H.323 protocol) or IP (H.320 protocol) can only directly connect to a machine using the same protocol. In general, however, ISDN lines are not available in most K-12 classrooms. Therefore, a unit that connects via IP is desirable for use in most situations. However, for the sake of expandability and flexibility, a unit that can connect via IP as well as ISDN is desirable.

Videoconferencing success requires patience, skill, and perseverance.

BEST COPY AVAILABLE

Using a special piece of hardware called a Gateway, however, it is possible to connect an IP unit with an ISDN unit and vice versa. The Gateway allows dissimilar units to communicate through a process called transcoding. Generally, a Gateway is an expensive unit and would not be purchased with a classroom unit. The Gateway would be housed, for example, at a district office and many videoconferencing units might connect through it.

In addition to a Gateway, a Gatekeeper application program is necessary in order to facilitate more efficient videoconferencing in this situation. The Gatekeeper serves to maintain security in a videoconferencing environment by only allowing only registered users and authorized connections to be made. It also allows for logging a connections and system maintenance.

Before considering a high-end videoconferencing system, a thorough evaluation of the specific needs of a site must be conducted. Once this has been done, a technical support network must be established to ensure that these highly technical units are properly configured and maintained. When this network is in place and the unit is purchased, all users should be properly trained so that the full potential of all videoconferencing opportunities can be experienced.

Videoconferencing technology is far from perfect in its current form. Of primary concern to all who embark on the endeavor to develop and maintain a videoconferencing program must be the time and effort required for success. Success in this field comes not only to those with technical expertise, but also to those with the patience and commitment to persevere.

BEST COPY AVAILABLE

References

Maring, G.H., Levy, E.W., & Schmid, J.A. (2002, November). Variations on a cybermentoring theme: Six literacy projects involving preservice teachers and students across grade levels. Reading Online, 6(4). Available: http://www.readingonline.org/articles/art_index.asp?HREF=maring2/index.html

Boxie, P., & Maring, G.H. (2001, May). Cybermentoring: The relationship between preservice teachers' use of online literacy strategies and student achievement. Reading Online, 4(10). Available: http://www.readingonline.org/articles/art_index.asp?HREF=/articles/boxie/index.html

Maring, G.H., Boxie, P., & Wiseman, B.J. (2000, November). School-university partnerships through online pattern books. Reading Online, 4(5). Available: http://www.readingonline.org/articles/art_index.asp?HREF=/articles/maring/index.html

To view a video example of the high-end videoconferencing referred to in this booklet,

Go to: http:/education.wsu.edu/literacy
Select: NEW! Polycom Movie 2002 (Quicktime, 12 MB)
If necessary, use the link to download *Quicktime*.

Copies of this booklet are available in printable, PDF format.

Go to: http://education.wsu.edu/literacy
Select: 2003 Educator's Guide to High End Videoconferencing

BEST COPY AVAILABLE

A Few Notes About the Information Contained in This Publication

This booklet details recent cyberprojects made possible through the use of high-end videoconferencing technologies. This field of study is still very much in the early stages of research and development and thus, any assertions made regarding impact on student learning and efficacy of the use of these technologies are purely the finding of our projects. For more information about results of past projects as well as cybermentoring in general, please see the readings on the preceding page.

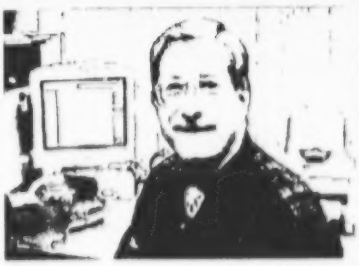
The information offered here is documentation of some of the knowledge that we have gained through seven years of work in the area. For further information, please consult the references on the previous page. These references are provided as an aid to researchers and educators who wish to explore the topic and possibly integrate some of these concepts and designs into their own work.

In our work, we have used Polycom© products for our high-end videoconferencing needs. This booklet in no way, however, is an endorsement by the researchers, or Washington State University, for the use of these products. Along with information about Polycom© products, this booklet also contains information about other high-end videoconferencing systems that are available.

Because we have not used the other systems we make no assertion as to their compatibility with Polycom© products or any of the peripheral devices, manufactured by other companies, described here, or the accuracy of the technical specifications contained herein. For current and more detailed information, please consult the websites of the manufacturers.

BEST COPY AVAILABLE

For More Information:



Gerald H. "Jerry" Maring
maring@wsu.edu
WSU, College of Education
C/O CO-TEACH
PO Box 642132
Pullman, WA 99164-2132
(509) 335-5651

Jason A. Schmid
jschmid1@wsu.edu
WSU, College of Education
C/O CO-TEACH
PO Box 642132
Pullman, WA 99164-2132
(509) 335-8053

Jeremy Roark
roarkjer@wsu.edu
WSU, College of Education
C/O CO-TEACH
PO Box 642132
Pullman, WA 99164-2132
(509) 335-8053

For information regarding cybermentoring and cyberpartnerships, visit the WSU Online Literacy Project Website at:

http://education.wsu.edu/literacy

Support in the preparation of this guide and the reserach it contains was provided by the following grant: Helmstetter, E.H. etal. (1994-2004). *Collaboration for teacher education accountable to children with high needs/CO-TEACH*[Title II Teacher Quality Enhancement Grant]. Washington, D.C.: U.S. Department of Education.

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educatonal Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE
(Specific Document)

ERIC Educational Resources Information Center

I. DOCUMENT IDENTIFICATION:

Title:	An Educator's Guide to High-End Videoconferencing		
Authors:	Jason A. Schmid, Dr. Gerald H. Maring, Jeremy B. Roark		
Corporate Source:	Washington State University	Publication Date:	3/2003

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options below and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents	The sample sticker shown below will be affixed to all Level 2A documents	The sample sticker shown below will be affixed to all Level 2B documents
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY SAMPLE TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
Level 1	**Level 2A**	**Level 2B**
◉	○	○
Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.	Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only.	Check here for Level 2B release, permitting reproduction and dissemination in microfiche only.
Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.		

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: Gerald H. Maring	Printed Name/Position/Title: Dr. Gerald H. Maring, Professor		
Organization/Address: Washington State University, College of Education, c/o CO-TEACH, PO Box 642132, Pullman, WA 99164-2132	Telephone: 509-335-5651	FAX: 509-335-5048	
	E-mail Address: maring@wsu.edu	Date: 4-24-03	

EFF-088 (Rev. 2/2001)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
4483-A Forbes Boulevard
Lanham, Maryland 20706

Telephone: 301-552-4200
Toll Free: 800-799-3742
FAX: 301-552-4700
e-mail: info@ericfac.piccard.csc.com
WWW: http://ericfacility.org